
SCHOOL OF LAW

Interdisciplinary Environmental Clinic

August 11, 2015

Mr. Stephen Hall
Chief, Air Quality Analysis Section
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102
Via email to: stephen.hall@dnr.mo.gov

Re: Supplemental Comments on 2015 Monitoring Network Plan

Dear Mr. Hall:

On behalf of the Sierra Club, we submit these supplemental comments on the Missouri Department of Natural Resources' ("DNR") proposed 2015 Monitoring Network Plan.¹ We previously submitted comments on the plan on July 20, 2015, urging DNR to refrain from proposing new sulfur dioxide ("SO₂") monitoring sites near Ameren's Labadie power plant until EPA completes an area designation for the plant by July 2016.

These supplemental comments are based on new information provided in DNR's proposed 2010 1-Hour Sulfur Dioxide Standard, Proposed Options for Area Boundary Recommendations, July 2016 Designations.² This information includes new modeling of Labadie's emissions performed by DNR, as well as new wind climatology data from a recently-installed meteorological monitoring station near the plant. The new DNR modeling confirms that at least one of the two new Labadie SO₂ monitoring sites is unlikely to capture maximum ambient SO₂ concentrations because it is not located in an area where peak SO₂ concentrations are expected to occur. The new wind climatology data calls into doubt the siting of the other Labadie SO₂ monitoring site as well and suggests that neither monitor may be appropriately sited for use in future NAAQS compliance evaluations. This further demonstrates why DNR should wait until EPA completes an area designation for Labadie before proposing new SO₂ monitoring sites near the plant.

I. New Modeling By DNR Confirms That The Valley Monitoring Site Is Not Located In An Area Where Peak SO₂ Concentrations Are Expected To Occur.

As described in our July 20, 2015 comments on the proposed 2015 Monitoring Network Plan, Ameren's modeling of Labadie's emissions for purposes of locating the new monitoring sites

¹ DNR, 2015 Monitoring Network Plan, June 12, 2015, available at <http://dnr.mo.gov/env/apcp/docs/2015-monitoring-network-plan.pdf>.

² DNR, 2010 1-Hour Sulfur Dioxide Standard, Proposed Options For Area Boundary Recommendations, July 2016 Designations, July 24, 2015 ("2016 Area Boundary Recommendations"), available at <http://dnr.mo.gov/env/apcp/docs/2010-so2-options-for-july-2016-desig-aug-27-2015-pub-hrg.pdf>.

identified three distinct areas where peak SO₂ concentrations are expected to occur. These areas, demarcated by orange and red receptors, are located northwest, northeast, and southeast of the plant and are shown in Figure 1 below. However, only one of the two new monitoring sites – the Northwest site – is located in a peak concentration area as modeled by Ameren. The Valley monitoring site is located between the other two Ameren-modeled peak concentration areas, in an area where the modeled concentration is only about 80 percent of the maximum concentration predicted by Ameren’s model.

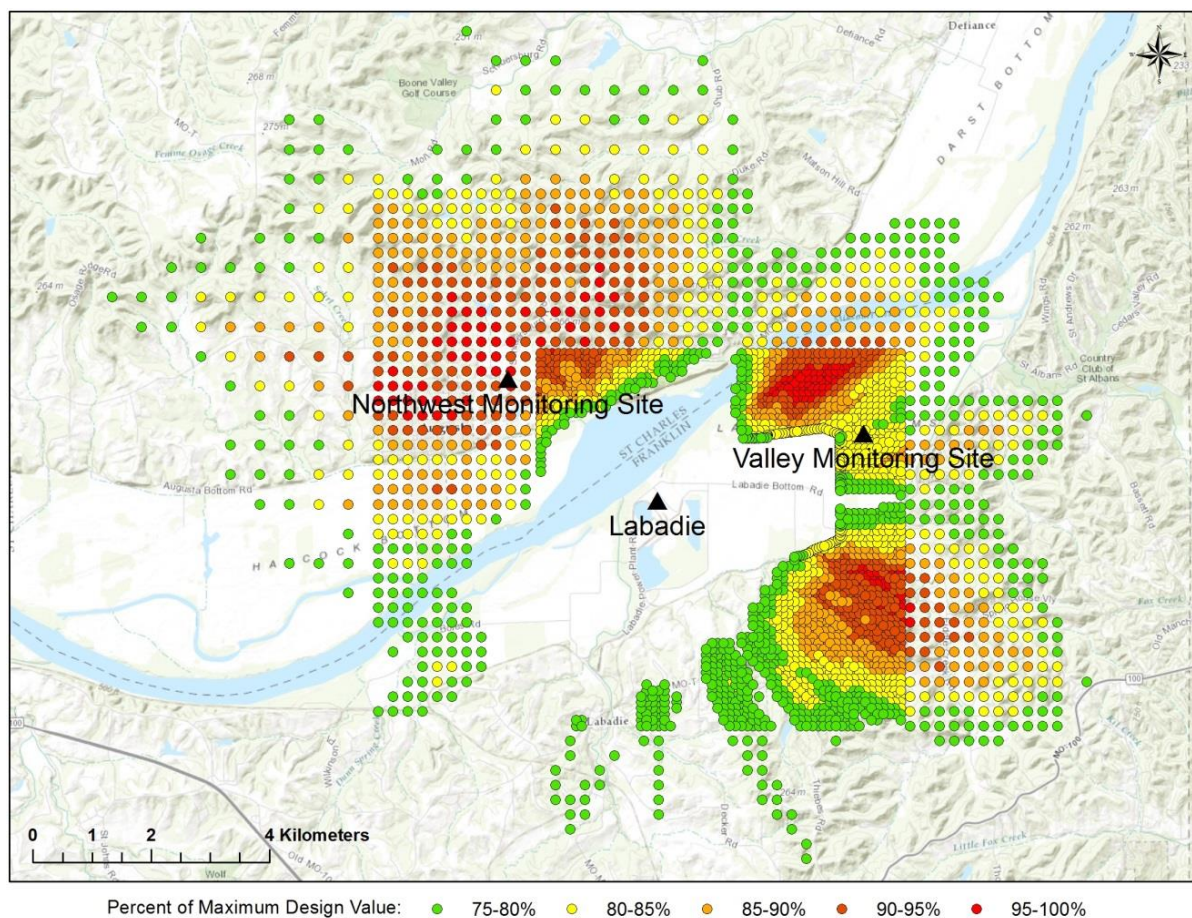


Figure 1. Expected peak SO₂ concentration areas per Ameren’s modeling.

Moreover, Ameren’s modeling was inconsistent with EPA guidance. In more detailed comments we submitted to DNR on April 13, 2015 critiquing Ameren’s proposed monitoring site locations,³ we noted that Ameren had failed to adhere to EPA’s source-oriented SO₂ monitoring guidance in its modeling of the plant’s emissions and therefore may have failed to correctly identify areas where peak concentrations are expected to occur. In particular, Ameren’s modeling

³ These comments were attached to and incorporated by reference into our July 20 comments on the 2015 Monitoring Network Plan.

used constant emission rates instead of hourly emission rates as recommended by EPA.⁴ Using hourly emission rates, which are readily available from EPA's online Air Markets Program Data tool, allows areas where peak SO₂ concentrations are expected to occur to be determined with greater confidence because the interaction between hourly emissions and hourly variations in meteorological parameters is accounted for by the model. This interaction is ignored when constant emission rates are used.

In its recently-proposed 2010 1-Hour Sulfur Dioxide Standard, Proposed Options for Area Boundary Recommendations, July 2016 Designations ("2016 Area Boundary Recommendations"), DNR describes the modeling of Labadie's emissions that it performed for purposes of making an SO₂ area designation and boundary recommendation to EPA for the area around the plant. DNR's modeling is identical to Ameren's in most respects and uses meteorological data from the same National Weather Service site (Jefferson City Memorial Airport in Jefferson City, MO).⁵ However, unlike Ameren, DNR used hourly emission rates per EPA guidance in its modeling. The peak concentration areas, demarcated by orange and red receptors, predicted by DNR's model are shown in Figure 2 (see next page). DNR's receptors violating the 2010 1-hour SO₂ NAAQS are shown in Figure 3 (see page 5).

DNR's modeling, as illustrated by Figures 2 and 3, confirms that the Valley monitoring site is not located in an area where peak SO₂ concentrations are expected to occur. To the contrary, the Valley site is in an area where the modeled concentration is less than 75 percent of the maximum concentration predicted by DNR's model. DNR's modeling also confirms that there is an expected peak concentration area southeast of the plant with considerably higher modeled SO₂ design values than at the Valley monitoring site, yet with no monitor. DNR's model predicts NAAQS exceedances in this other area, but not at the Valley site.

In summary, DNR's modeling – which, unlike Ameren's, adhered to EPA guidance as to the use of variable hourly emission rates – makes clear that the Valley site is not an appropriate location for an SO₂ monitor.

II. New Wind Climatology Data From the Valley Monitoring Site Demonstrates The Need To Collect Additional On-Site Meteorological Data Before DNR Proposes New SO₂ Monitors Near The Labadie Plant.

The Valley monitoring site, which began operating in April, includes both an ambient SO₂ monitor and a meteorological monitoring station that monitors various meteorological parameters including horizontal wind speed and direction. Preliminary data from the Valley meteorological monitoring station for the period April 22 – July 13, 2015 is included in Appendix F of DNR's 2016 Area Boundary Recommendations. Analysis of this data suggests

⁴ U.S. EPA, SO₂ NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, Dec. 2013 Draft, at 11, referencing U.S. EPA, SO₂ NAAQS Designations Modeling Technical Assistance Document, Dec. 2013 Draft, at 10, available at <http://epa.gov/airquality/sulfurdioxide/pdfs/SO2ModelingTAD.pdf>.

⁵ DNR's modeling includes an emergency diesel generator at Labadie and a pair of interactive sources south of the plant that were not included in Ameren's modeling. However, these sources have very low emissions and do not contribute significantly to modeled concentrations near the plant.

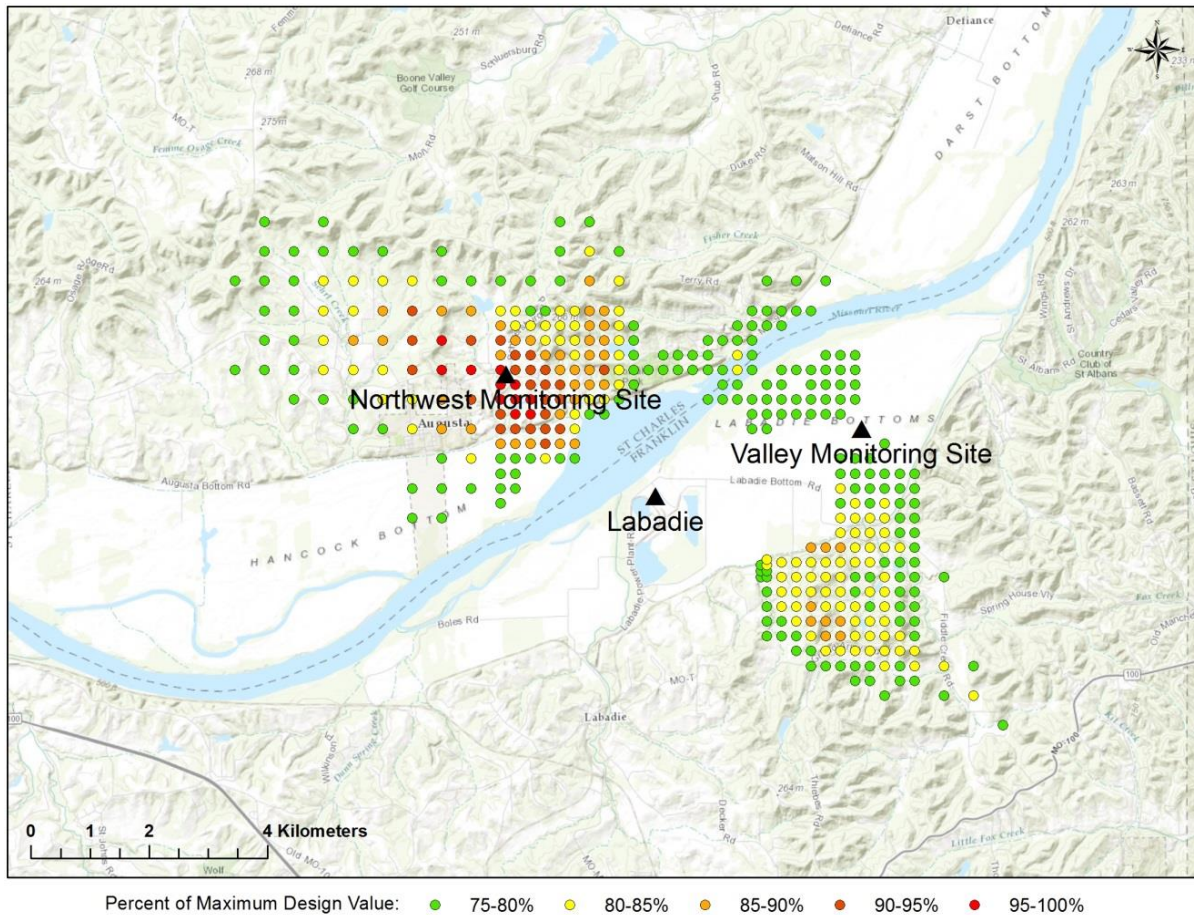


Figure 2. Expected peak SO₂ concentration areas per DNR's modeling.

that the surface meteorological data used in both Ameren's and DNR's modeling of Labadie's emissions may not be representative of the area.

Ameren and DNR both used surface meteorological data from the Jefferson City Memorial Airport ("KJEF"), located approximately 115 kilometers west of Labadie, in their modeling of the plant's emissions instead of data from the much closer Spirit of St. Louis Airport ("KSUS"), located just 19 kilometers northeast of the plant. In making the decision to use KJEF instead of KSUS surface meteorological data, DNR relied exclusively on a comparison of surface characteristics (surface roughness, Bowen ratio, and albedo) at each airport to surface conditions at Labadie. Despite stating in its 2016 Area Boundary Recommendations that "other meteorological parameters, including wind speed and direction as influenced by terrain, must also be used when choosing a representative meteorological site,"⁶ DNR did not compare available wind climatology data from the Valley monitoring site to contemporaneous wind climatology data from KJEF and KSUS to see which airport's winds are most similar to those at Labadie.

⁶ 2016 Area Boundary Recommendations at D-2.

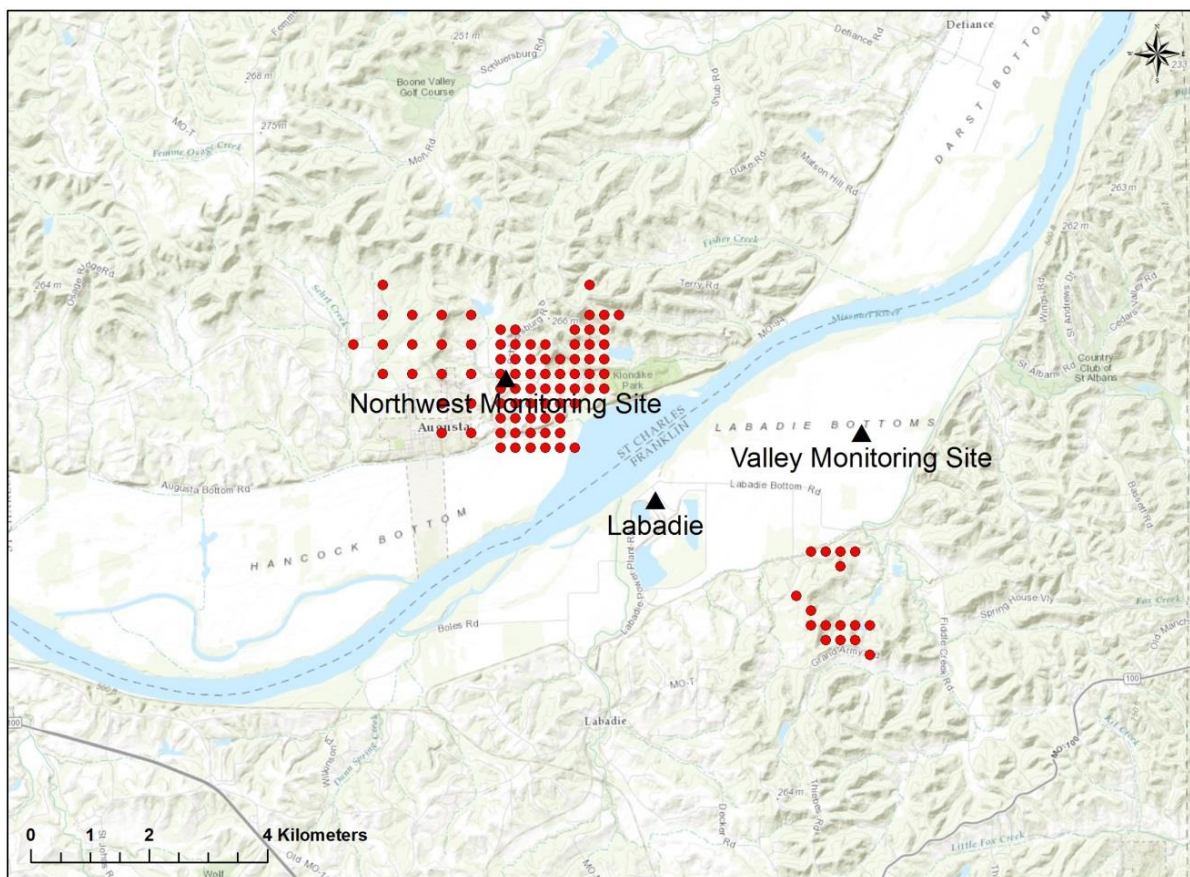


Figure 3. DNR receptors violating the 2010 1-hour SO₂ NAAQS.

Figures 4 and 5 (see next page) show the wind rose for the Valley monitoring site compared to the wind roses for KSUS and KJEF, respectively, for the period April 22 – July 13, 2015. As illustrated by Figures 4 and 5, during the first few months the Valley meteorological monitoring station was in operation, the most frequent winds at both Labadie and KSUS were from the south, south-southwest, and southwest, whereas the most frequent winds at KJEF were from the east and east-southeast. Furthermore, the strongest winds at both Labadie and KSUS were generally from the predominant wind directions whereas the strongest winds at KJEF were from the south and south-southwest, orthogonal to the predominant wind directions.

Therefore, the preliminary meteorological data from the Labadie area suggest that the winds at Labadie may be more similar to the winds at KSUS than the winds at KJEF, which in turn suggests that KSUS surface meteorological data may be more representative of the area and more appropriate for modeling Labadie's emissions than KJEF data.

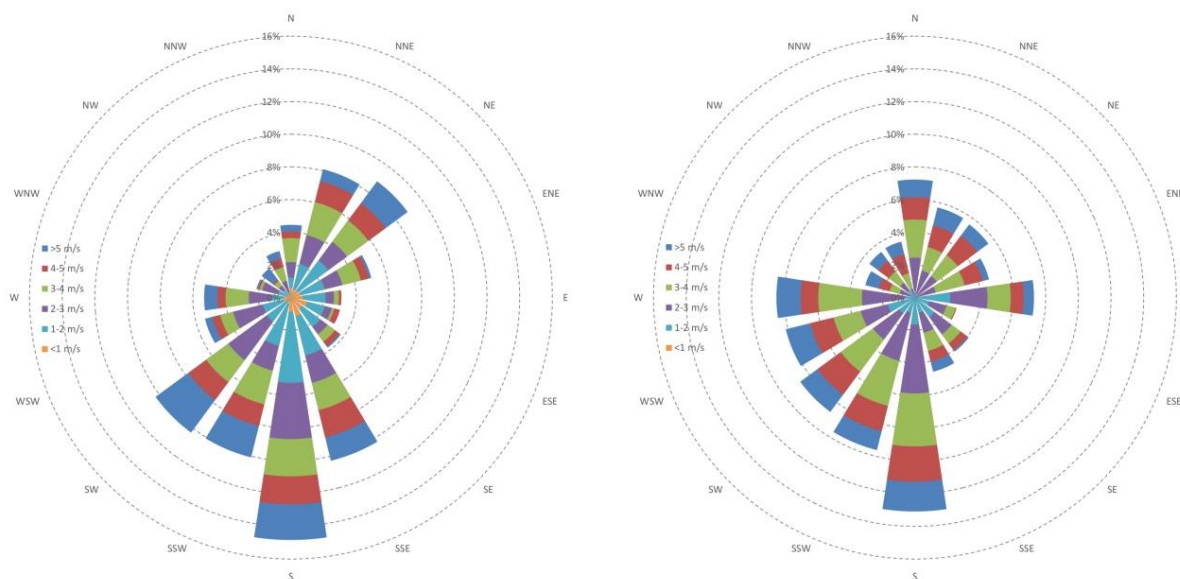


Figure 4. Valley monitoring site (left) and KSUS (right) wind rose comparison.

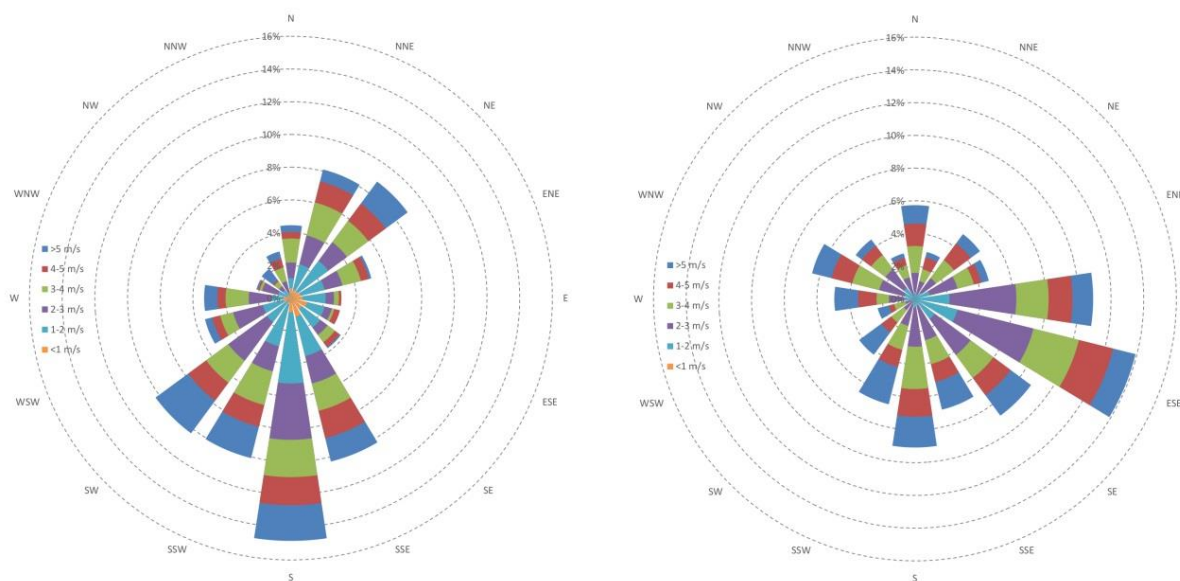


Figure 5. Valley monitoring site (left) and KJEF (right) wind rose comparison.

Figure 6 (see next page) shows peak concentration areas, demarcated by orange and red receptors, predicted by DNR's model when KSUS surface meteorological data is used instead of KJEF data. The results are striking; *if KSUS data is in fact more representative of the area than KJEF data, then neither the Valley monitoring site nor the Northwest monitoring site is located in an area where peak SO₂ concentrations are expected to occur and neither is appropriately sited for use in future NAAQS compliance evaluations.*

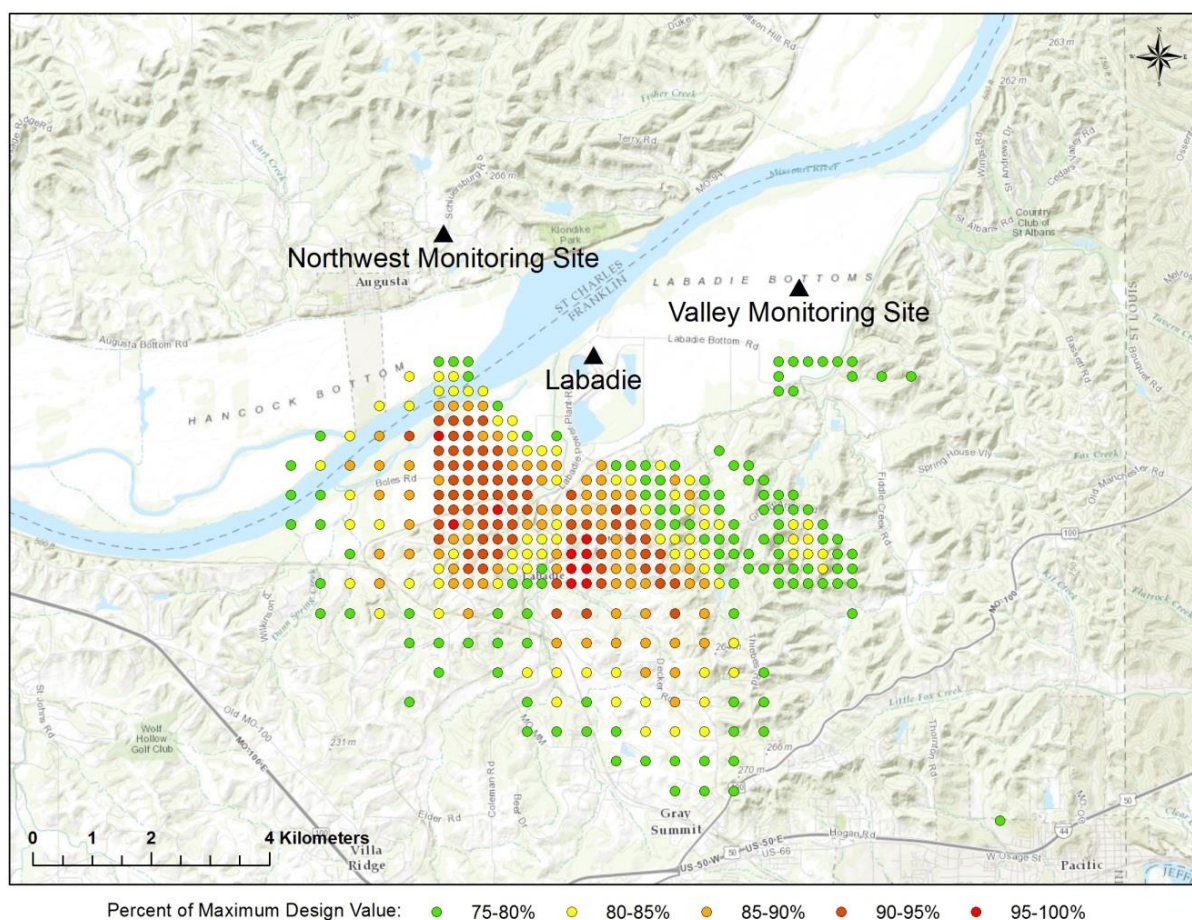


Figure 6. Expected peak SO₂ concentration areas per DNR's modeling using KSUS instead of KJEF surface meteorological data.

We recognize that the wind climatology data from the Valley meteorological monitoring site included in Appendix F of DNR's 2016 Area Boundary Recommendations is not yet quality assured and that, given the short-term nature of the data, it is by no means certain that the winds at Labadie will prove to be more similar to the winds at KSUS than at KJEF over the long term. However, this only demonstrates further why DNR should wait until EPA completes an area designation for Labadie before proposing new SO₂ monitoring sites near the plant. EPA must make a final area designation for the plant by July 2016.⁷ By that time, DNR will have over a year of on-site meteorological data from the Valley monitoring site and a second meteorological monitoring station at the nearby Osage Ridge monitoring site,⁸ which it can then use to model Labadie's emissions for monitor-siting purposes or to make a more definitive determination regarding which airport site has the most representative meteorological data and should be used in such modeling.

⁷ *Sierra Club v. Gina McCarthy*, No. 3:13-cv-3953-SI (Consent Decree, March 2, 2015).

⁸ No data from the Osage Ridge site was included in the 2016 Area Boundary Recommendations so it is unknown how winds at the site compare to winds at the Valley monitoring site, KSUS, or KJEF.

Conclusion

For the reasons set forth above and in our July 20 comments on the 2015 Monitoring Network Plan, DNR should withdraw both of the new Labadie SO₂ monitoring sites pending the completion of the Labadie area designation process, the collection of additional on-site meteorological data from the Valley and Osage Ridge meteorological monitoring stations, and the performance of additional modeling using the most representative surface meteorological data to determine the areas of expected peak ambient SO₂ concentrations around the plant. Furthermore, EPA should not approve the 2015 Monitoring Network Plan with the inclusion of the new Labadie SO₂ monitoring sites and should reject it pending their withdrawal by DNR.

Sincerely yours,



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